APPROACHES TO RESEARCH ON TRANSFERABLE DEVELOPMENT RIGHTS PROPOSALS: AN OVERVIEW

Joseph Diamond and Bruce E. Lindsay

COMMENTS AND NOTES

Present land use control mechanisms are seen as inadequate for the preservation of open space, agricultural land, and other "uneconomic" uses of land. Many proposals have been cited as possible solutions to the problems created by present land use control mechanisms. The transfer of development rights (hereafter known as TDR's) is one such proposal. This mechanism for land use control can be of several forms.[1] There are severe theoretical and practical problems, to be discussed, which a transfer of development rights program must overcome if it is to function in practical application.

TDR is a program which utilizes the basic concepts of zoning and seeks to prevent the economic incentives to alter zoning by giving "just compensation" to the landowner who cannot develop his land to its highest market potential due to zoning for low density or nondeveloped purposes. In exchange for low density zoning and the forfeiting of the right to fully develop his land, the restricted landowner is given "development rights." The development rights are then purchased by land developers who must be in possession of a certain number of development rights to be allowed to develop the land in a specified development area over a pre-determined level of density. In this manner, development can take place, though only in specified areas, and restricted landowners may receive compensation for not being able to develop their land. In theory, society benefits from the preservation of open space, agricultural land, and myriad other "uneconomic" land uses.

In theory, TDR is a good planning tool. Desirable land uses are obtained with little public cost. Owners of controlled property are compensated in the form of cash or development rights and property tax reductions. Developers who buy development rights can exceed conventional zoning regulations and pay no more than they normally would for the purchase of additional lands. In short, ideally, all parties involved in the TDR program are economically better off while open space, agricultural land, and other "unprofitable" uses of land are maintained.

TDR MODELS

Little is actually known of the practical implications of the program due to the newness of the application of a TDR program. The overall economic and legal implications remain to be seen. Research into these implications has been attempted by the use of several techniques, including partial and general equilibrium models and benefit-cost analysis. It is the purpose of this comment to provide a general discussion of these techniques as applied to TDR's as well as to summarize some of the problems and caveats that decision makers must reconcile in evaluating TDR's.

Partial Equilibrium Model

The Partial Equilibrium Model has been the basic model upon which most economic analysis of TDR programs has been based. It is understandable that the initial focus of many economic studies looks at the demand for TDR's since the communities could create the quantity (supply) depending on the type of TDR program chosen. With adequate demand for TDR's the return to landowners from the sale of TDR's will compensate the owners for losses created by the development restrictions on their land. Hence, demand for TDR's is the crucial element in whether a TDR program will be feasible. Needless to say, in the determination of price, supply is as important as demand. However, emphasis on the demand side assumes that the amount of municipal property is fixed. Thus, the private individual and community preferences represent a point on a supply curve telling us a portion of the information when, what amounts, and how much property will be sold.

Several demand studies, exemplified by Field and Conrad (1975), Barrows and Prenguber (1976, pp. 1-23) and Ishee (1974), have been undertaken. The development of a recursive linear programming model by Small, *et al.* (1978) to analyze the demand for development right certificates for a demonstration project in South Brunswick, New Jersey, was recently completed. This model maximizes the total residual value to developers given certain constraints (the number of homes and types of homes per year and gross densities). This analysis of the market lays the ground work for drafting the proposed TDR ordinance. The LP model used looks at eight future market conditions and public policies toward housing with the tradeoffs explicitly stated. This type of analysis is extremely sensitive to future market prices but it has the advantage of laying out the tradeoffs implicit in institutional rules (for the demand for TDR's) affecting the housing market.

A study by Smith (1977) attempted to derive and empirically estimate the demand for TDR's for two transfer districts. Three interesting caveats of Smith's study were found which would need to be incorporated into a general equilibrium model for TDR's to get an "optimal" solution:

—The market or demand estimates were for two towns rather than a metropolitan region, which overlooks the fact that there may be high cross elasticities of demand between housing units in neighboring and therefore TDR municipalities. Also, the demand elasticity for a metropolitan area may be quite different than for a municipality.

—Production schedules (of housing units) can be derived from supply functions of TDR's and land in the transfer district. With these two modifications the Smith model can calculate an optimal solution.

—Additional changes in variables such as local service, zoning change pressure, neighborhood income, *etc.* would be necessary for a dynamic model solution since these would directly affect production schedules.

Joseph Diamond is Assistant Professor of Land Economics, Department of Agricultural Economics and Rural Sociology, University of Connecticut, and Bruce E. Lindsay Assistant Professor of Resource Economics, Institute of Natural and Environmental Resources, University of New Hampshire. This paper results from research project funds of NE-125, "Socioeconomic Factors and Rural Land Use." The authors would like to acknowledge the helpful comments put forth by Marilyn Altobello, Robert Leonard, Edmund Jansen, and Paul Bruns. Connecticut Agricultural Experiment Station Contribution No. 762 and Scientific Contribution No. 970 of the New Hampshire Agricultural Experiment Station.

General Equilibrium Model

The essential components of a General Equilibrium Model are the supply and demand functions. A demand function generally is based on the assumption that consumers seek to maximize their utility, given income and the price of commodities; or, in the case of TDR's, land owners maximizing their utility subject to given income and the price of development rights, land, and construction costs (if in fact owners pursue development). The supply function is premised on the assumption that under competitive market structure, the cost of production of each commodity (for example, housing) must equal its market price.

An inspection of the literature indicated that nothing has yet been published concerning TDR's based upon a General Equilibrium Model. This can be due to the newness of the TDR concept and the difficulty of including all possible variables in the analysis. The cross-elasticity of demand for development rights between communities (the differing elasticities of demand for development rights between communities), the effect of changes in the broader macroeconomic trends of the economy as a whole, variations in intraregional construction costs and land prices, the future demands for transportation and social services, and the varying effects of state and local fiscal decisions are but a few of the variables that could be included in a General Equilibrium Model analysis of a TDR program.

The scope of a TDR program extends over a specified geographic area. The area of a TDR program probably will not be at the regional level to begin with and certainly a local initiative would bring benefits closer to costs in terms of geography. However, it has been noted by Conrad and also Smith that TDR planners will have difficulties with programs until a more regional approach is taken (Merriam, p. 123). The demand for dense development via the demand for TDR's may have to be assisted by the provision of some amenities such as favorable local expenditure to local tax relationship (Smith, p. 167-168). Therefore, state assistance to regions to encourage transfer districts for TDR's to preserve open space or prime farmland has been suggested. Another way which an area larger than a township may be involved in a TDR program is through intertown compacts. Where there is a physical compatibility of land, similar community preferences and market development, then the future of TDR's may move in this direction.[2] However, without a more regional approach for a TDR program, it is unlikely that a general equilibrium model will be needed.

Cost-Benefit Model

The Cost-Benefit Model is utilized in a very unique sense for evaluation of a TDR program in comparison to the usual classic Cost-Benefit formulation. Distributional aspects of TDR are incorporated into this framework very similar to water distributional resource models suggested by Major (1973). Emphasis is placed upon who pays and who benefits. From the perspective of a Cost-Benefit Model, the development is such that development externalities (i.e., pollution, congestion, soil erosion, etc.) do not enter the decision making calculus of an individual developing his land. The costs of development, resulting in particular externalities, are not generally absorbed by the property owner, but are paid by others and society in general. The benefits of development are largely accrued to the property owner or developer. Therefore, the market fails to allocate resources efficiently, and governmental action is justified to correct this problem.

A TDR program from the perspective of this type of Cost-Benefit Model is seen as a means of reducing the externalities of land development. As in the earlier cases, development rights would be assigned to landowners in exchange for their right to develop their land. Their rights will be purchased by developers seeking to develop lands in the specified area, above a certain minimum level of density. In such a manner the development externality of the disappearance of open space, agricultural land, and the like is internalized in the decision making process so as to prevent the disappearance of those lands. This internalization process really involves allocating and reallocating Pareto-irrelevant externalities when communities or a county/region embark on a TDR program. Instead of the competition for land value appreciation which can frustrate a public land use policy, we have the reallocation of private property rights. And we have the creation of a new public good—preservation of open space, agricultural lands, etc.

There is the possibility that owners of property located near or adjacent to transfer or transferee areas must bear some uncompensated burden. Their property value may decline with the declaration of the transfer zone. The owner of adjacent property may fail to realize gains anticipated from new development in the transfer area. For example, if a large structure is built on the transfer area, the adjacent landowner may lose access to air, light, and view. "However, any damages can be held to a minimum if reasonable planning controls govern the transfer. Certainly the owner of affected property should have a say in the review process (Schlares, p. 9)."

Only a limited number of studies exist which utilize this approach for evaluation of a TDR program. A very crude delineation of benefits and costs was made for the private market of TDR's by Derr, Norman and Schneider (p. 195). Field and Barclay offer perhaps a more fruitful Cost-Benefit approach for the evaluation of a state development rights assessment program. Their framework can easily be adopted for needed policy recommendation for public agencies in evaluating the economic and equity effects of implementing a TDR program.

PROBLEMS WITH TDR PROGRAMS

The goals of a TDR program are the preservation of specific lands and a minimization of the "windfall-wipeout" dilemma. However, many problems exist for TDR programs which have major impacts upon the success and net impact of a TDR program once it is removed from the abstract and applied in practice.

Much discussion exists over the definition of "just compensation" which should be given to restricted landowners. Most literature defines this compensation as the market value of the land without the particular restriction minus the value subject to the restriction of a TDR program. The concept of "just compensation" has not been precisely quantified. No TDR program can guarantee "fair" or "just compensation" to any person directly or indirectly involved.

The definition of a "development unit," which in effect defines land acreage and development right requirements, is crucial to the smooth functioning of a TDR program. The definition of a "development unit," which determines the number of development rights which must be purchased for various types of development, is crucial in determining the initial cost incidence of the TDR program.

The method by which development rights are distributed will affect the economic impact on restricted landowners. If development rights are distributed at a flat rate; that is, an equal number are given per unit of land, then those landowners with higher potential property value, relative to other restricted property owners, will lose out. If, however, development rights are distributed in such a manner as to reflect the differing development potential among land parcels, then the economic results to some restricted landowners will be favored.

CONCLUSIONS

TDR's involve a choice of conflicting rights for communities. It attempts to grapple with the problem of guiding community growth. Alternative community decision making rules will affect land values (the distribution of economic rents) and land patterns (types of land-use and their externalities). The type of TDR market and consequently the distribution of costs and benefits for a community is needed to evaluate whether net economic benefits exist. From an empirical perspective, this has been lacking for TDR's. To date, researchers have not focused on the "distribution of land value appreciation as the key element of the local political economy (Libby, p. 9)." What modeling has been done has largely been in estimating the demand for TDR, mostly using simulation techniques.

Ultimately, it is the interaction of supply and demand (alternative rules for access to TDR) that must be investigated given various types of institutional arrangements for TDR's. In time, we should be directing our focus to rule changes such as:

—the master plan and the distribution of TDR's,

—the base zone level,

—the type of TDR programs (government/private or a mix).

Policy economists should assess reasons for changing zoning regulations by various TDR programs. Some of the potential reasons have been mentioned earlier, such as externalities of growth that are neglected by the private market system and a partial solution to the windfall-wipeout problems of zoning. But other factors may be at work, such as curbing growth and boosting land values, and policy analysts should investigate this. And finally, some assessment is needed of government's ability to implement a TDR program. It is essential that resources and materials are available and that acceptance by local decision makers and administrators of the program exists.

REFERENCES

Barrows, Richard L. and Bruce A. Prenguber. *Transfer of Development Rights: A Theoretical and Case Study Analysis of New Land Use Policy*. Center for Resource Policy Studies, College of Agriculture and Life Sciences, University of Wisconsin, Madison, February 1976.

Field, Barry C. and R. A. Barclay. "Accounting for the Social Benefits and Costs of Development Right Purchase Programs." *Journal of the Northeastern Agricultural Economics Council*, April 1977.

Field, Barry C. and J. M. Conrad. "Economic Issues in Programs of Transferable Development Rights." *Land Economics*, November 1975.

Ishee, Sidney, "Preserving Open Space Through the Private Transfer of Development Rights." Paper presented at Inaugural Convention of the Eastern Economics Association, SUNY at Albany, October, 1974.

Libby, Larry. "Conflicting Rights to Rural Resources: A Research Strategy for Improved Public Choice." Paper presented at the Northeastern Agricultural Economics Council Annual Meeting, Durham, New Hampshire, June 1978.

Major, D. C. "Benefit-Cost Ratios for Projects in Multiple Objective Project Impacts." *Water Resources Research*, 9(1973):1.

Merriam, Dwight H. "Making TDR Work." *The North Carolina Law Review*, January 1978.

Small, Leslie E., Victor Kasper, Jr. and Donn A. Derr. *Transfer of Development Rights Marketability*. New Jersey Agricultural Experiment Station, Rutgers University, 1978.

Smith, Stewart Nelson. *The Demand for Transferable Development Rights: Theory, Specification, and Estimation Model*. Ph. D. Dissertation, Department of Agricultural Economics and Rural Sociology, University of Connecticut, 1977.

FOOTNOTES

[1]There are two basic types of TDR programs—relying on the market mechanism for development rights transfer and governmental intervention in the buying and selling of development rights.

[2]One of the major difficulties associated with a regional approach to TDR is the transfer of real property (and thus tax base) across political boundaries.